of a bright red color. It melts at 192–3° (corrected) to a clear deep yellow oil.

Analysis: 0.1468 gram consumed 3.3 cc. $\frac{N}{10}$ acid (Kjeldahl-Gunning Arnold Method) = 3.15 per cent N. Theory for $C_{19}H_{16}O_3NS_2Br$ = 3.11 per cent N.

SUMMARY

2-thio-3-(2-p-xylidyl)-5-thiazolidone has been synthesised.

Its condensation products with benzaldehyde, cinnamaldehyde, vanillin, 5-brom vanillin and $\alpha\beta$ dibrom β phenyl-propionaldehyde have been prepared and described.

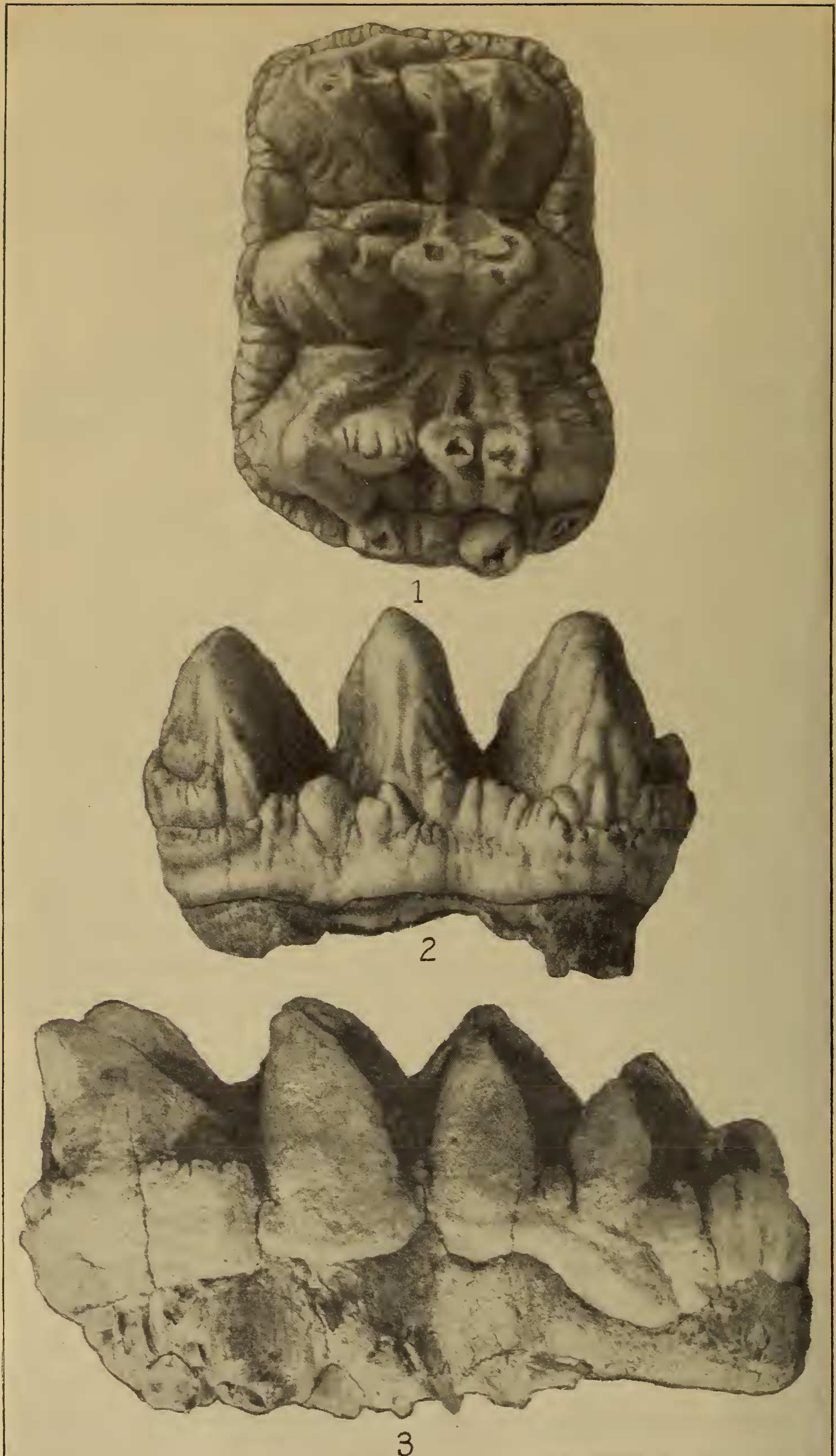
PALEONTOLOGY.—*Two new Pleistocene mastodons.* OLIVER P. HAY, Carnegie Institution of Washington.

On examining a collection of the teeth which are identified as those of *Mammut americanum*, one is surprised to see the great amount of variation among them; variation in size, in width relative to the length, height of the cones of cross-crests, roughness or smoothness of the enamel, number of cross-crests in the hindmost molars, development of the talons, strength of the crests (*cristae*) which descend from the summits of the principal cones into the valleys, and various other features. One is compelled, too, to recognize the frequent intergradations among these various molars; and one is led to wonder whether one highly variable species is represented or whether a number of closely related forms are indicated. Apparently nobody has yet undertaken to connect the differing molars with geographical regions or with geological horizons.

The writer has before him two molars which he ventures to describe as new species.

Mammut francisi, new species (Fig. 3 and 4)

The writer has received for examination, from Dr. Mark Francis, College Station, Texas, a tooth of a mastodon which presents a number of peculiarities and which appears to be worthy of description and a distinctive name. This tooth was found in Brazos River, at Pittbridge, Burleson County. It is the upper right third molar and had not yet begun to wear. One striking feature is the great width of the tooth. It is possible that this is abnormal, but there is no indication of it, and a tooth of *M. americanum* at hand is as wide at the first two crests, but does not diminish so much in width at the third and



Figs. 1 and 2. *Mammut oregonense*. Type. × 0.65+. 1. View of grinding face. 2. View of inner face. Fig. 3. *Mammut francisi*. Type. × 0.71+. View of outer face.

fourth crests. The total length is 147 mm.; the width taken at the first and second cross-crests is 100 mm. At the third and fourth

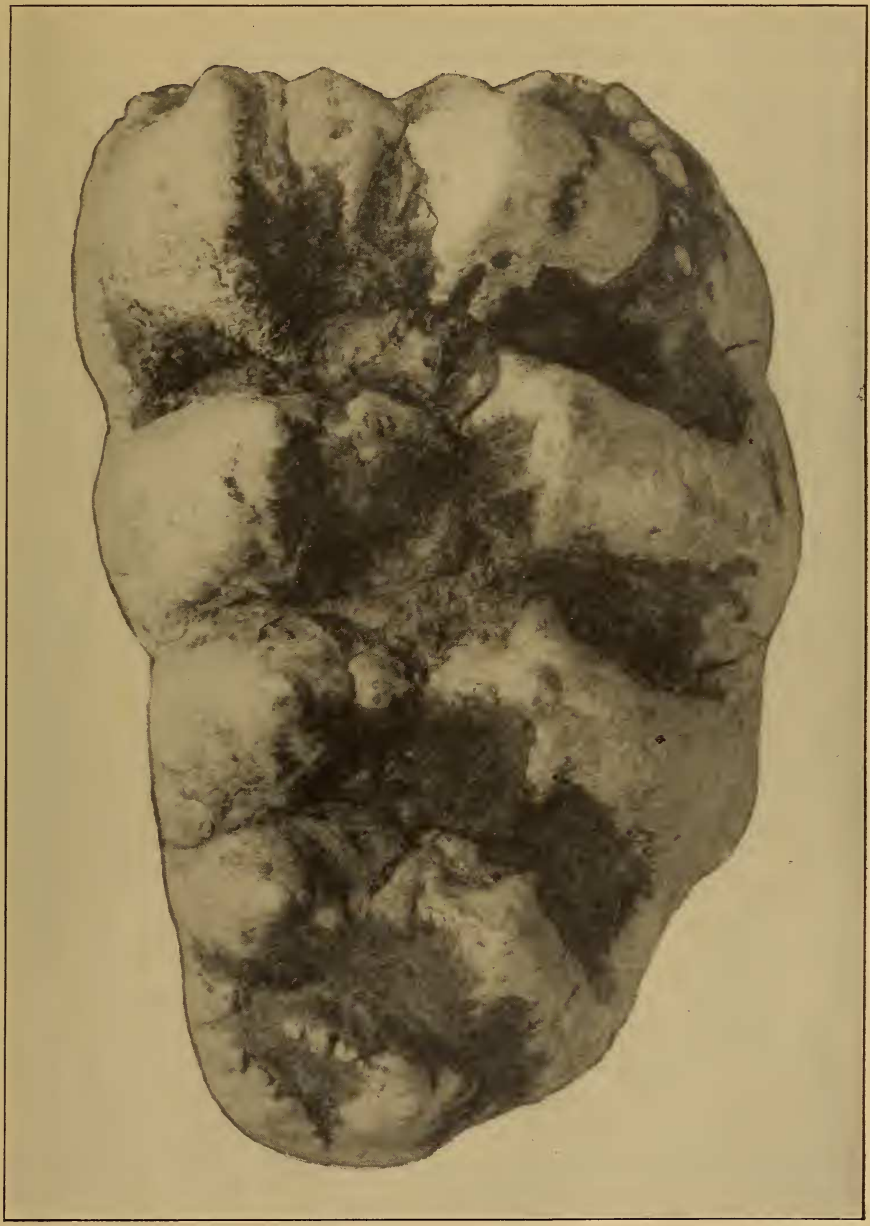


Fig. 4. *Mammut francisi*. Type. × 1. View of grinding face.

cross-crests the width is respectively 86 mm. and 70 mm. It may be said that there is a small fifth crest, only the pretrite portion of which is developed. Behind this is what may be regarded as a small talon. The buccal border of the tooth is straight; the lingual border, strongly convex. One might expect the reverse condition.

Around the base of the crown is a cingulum, showing especially in front and at the ends of the valleys, small on most of the ends of the crests. In all of the valleys is a thick deposit of cement, and this covers the slopes of the cross-crests almost to their summits, (fig. 4). The enamel is white; the cement is stained brown. The bases of the roots, as seen in figure 3, are covered with cement.

The crown is of moderate height. The following are the measurements of the cones taken along the slopes from the base of the crown. On the posttrite side these measurements differ but little from the perpendicular height; on the pretrite side they are greater, because of the lesser slope.

Heights of cones of cross-crests are as follows:

Posttrite	*mm.*	Pretrite	*mm.*
1.	57	1.	71
2.	56	2.	67
3.	50	3.	65
4.	47	4.	55
		5.	57

The pretrite cones possess conspicuous front and rear crests, or ridges, which descend into the valleys from the apex of each cone. These ridges are exaggerations of those found in most teeth of *Mammut americanum*, but they are in some cases even surpassed in teeth which pass for those of the species last mentioned. From the summit of the principal cone of the posttrite half of the cross-crests, a less prominent ridge descends to the valley on each slope; also from the secondary cone of this half, a feeble ridge or welt is sent down in front and behind. What especially characterizes the tooth from Pittbridge, aside from its shortness and width, is the extent to which the valleys are blocked up by the bases of the cross-crests. The heights of the first and second pretrite cones are 71 mm. and 67 mm. respectively. From a line joining their summits the first valley is not more than 20 mm. deep; the second valley is 15 mm. deep. The shallowness of the valleys is shown by figure 3. Notwithstanding the great width of the tooth the distance apart of the apices of the pretrite and posttrite cones is small, 40 mm., 39 mm., 35 mm., 30 mm., respectively from the first to the fourth cross-crests. That part of the cross-crests between the principal cones is sharp and the conules usually present in *Mammut americanum* are feebly or not at all developed.

An upper left third molar of *Mammut americanum* (Cat. no. 335, U. S. Nat. Mus.), said to have been found in alluvial banks of the Susquehanna River, is 175 mm. long and 102 mm. wide at the second cross-crest. It has strong descending ridges on the faces of the pretrite cones, weak ones on the cones of the other half of the cross-crests. The whole crown is rough with welts and small knobs. At the ends of the valleys are large conules. On the summit of the posttrite half of each cross-crest is a row of four or five conules; others less distinct on the pretrite side. The cones are high, the second about 73 mm. The valleys, where the descending ridges meet, are 30 mm. from the summits of the cones in the first and second valleys.

Believing that the tooth here described from Pittbridge represents a species of *Mammut* not hitherto recorded and wishing to honor the finder, the writer proposes to call it *Mammut francisi*.

Mammut oregonense, new species (Fig. 1, 2)

In the U. S. National Museum is a mastodon tooth (Cat. no. 4911) which was sent there in November, 1900, by Dr. Waldemar Lindgren, from Baker City, Baker County, Oregon. It had been found by the Cartwright Brothers, placer miners, at Rye Valley, on Dixie Creek, in township 13 south, range 43 east. Dr. Lindgren reported that the tooth had been found in a fluviatile clay bed which had formed a part of a bench of auriferous gravels, overlying the Payette beds. He regarded the fluviatile clay as of Pliocene age. It appears more probable that the bed belonged to the Pleistocene, for in it was discovered a tooth of *Elephas columbi*.

With this tooth came another of *Mammut* (Cat. no. 4912), a well-worn fragment of the rear of M_3 of left side, showing 2 cross-crests, width 68 mm. It may or may not belong to *M. oregonense*. The type tooth here described and figured is the upper left second molar. It has been regarded as belonging to *M. americanum*, but it is so different that the writer ventures to give it a distinct name.

The tooth had apparently not yet begun to suffer wear; or, if at all, only slightly on the first cross-crest. The length is 111 mm.; the width of the front end, 74 mm.; of the rear end, 80 mm. The crown presents 3 cross-crests and, in the rear, a talon. The crests are high, and the valleys narrow. The ends of the cross-crests slope steeply and nearly equally. The summits of the two principal cones of each crest are well separated, as follows: First crest, 38 mm., second, 40 mm., third, 40 mm.

The heights of the principal cones from the base of the crown are as follows:

Pretrite	mm.	Posttrite	mm.
1	55	1	43
2	58	2	48
3	58	3	52

On the front and rear faces of the main pretrite cones strong ridges, or crests, run down into the valleys, but where they meet they block the valley but little, inasmuch as they flatten and subside. The first and second valleys are 30 mm. deep below a line spanning the summits of the pretrite cones. On the posttrite side narrower ridges descend into the valleys from the summits of both the main and the secondary cones. Besides these ridges, stronger or feebler welts occupy the sides of the cones.

All around the tooth is a heavy cingulum composed, at the pretrite ends of the valleys, of 5 or 6 tooth-like conules. On the posttrite side the conules are smaller and more numerous. At the front and rear ends the cingulum is more bead-like. At the rear, in front of and above the cingulum, is the talon composed of 3 large conules, of which the inner one has an elongated, the middle one a triangular, the outer one an elliptical base.

In his work on mastodons, Dr. Günther Schlesinger,[1] in an endeavor to show that *Mastodon tapiroides* belongs, not in the bunodont, but in the zygolophodont series, calls attention to the crests which descend from the summits of the cones on the posttrite ends of the cross-crests of the zygolophodont mastodons. On his page 160 he presents the characters which distinguish *M. tapiroides* from the bunodont type, as represented by *M. angustidens* (= *Gomphotherium leptodon*). On his page 174 he goes on to say that in addition to all those characters there is another which excludes from the bunodont type not only *M. tapiroides*, but all of the zygolophodonts. This is the presence of those *cristae*, or crests, which are found on the slopes of the principal and the secondary cones of the posttrite end of the cross-crests. Among the bunodonts he affirms they are never present. The present writer regards this statement as an error. These crests are found especially

[1] *Die Mastodonten*, etc. Denkschr. nat.-hist. Staatsmus. 1. 1921.

well developed on the posttrite ends of the cross-crests of *Gomphotherium* (*Mastodon*) *floridanum;* and distinct traces at least, of these crests are seen in other bunodont species, even in upper molars of *G. leptodon.*

RADIOTELEGRAPHY.—*The present status of radio atmospheric disturbances.*[1] L. W. AUSTIN, Laboratory for Special Radio Transmission Research.[2]

Our knowledge concerning the atmospheric disturbances is still very meager. The observed facts may be cataloged as follows: (1) In general, atmospherics are stronger at the longer wave lengths. (2) Except for the effects of local storms, they are nearly always stronger in the afternoon and night, while for the higher frequencies this increase in strength is confined usually to the night alone. (3) They are stronger in summer than in winter, (4) in the south than in the north, and (5) on the land than on the ocean. (6) A large proportion of them appear to be directive; that is, to come from definite regions, or centers, as mountain ranges, rain areas, or thunderstorms. It is also reasonably certain that (7) at least most of the long-wave disturbances travel along the earth with a practically vertical wave front,[3] like the signals; (8) that a considerable portion are oscillatory in character, though a certain portion are non-oscillatory and give rise to shock oscillations in the antenna at all wave lengths; and (9) that disturbances sometimes occur simultaneously at stations thousands of miles apart.[4]

The origin of the ordinary rumbling disturbances (grinders) has been the subject of many conjectures. Eccles[5] believed at one time that he had found the source of this type of disturbance, as far as England was concerned, in distant thunderstorms, especially in Western Africa. DeGroot[6] has suggested that the grinders are due to the bombardment of the upper atmosphere by electrons from the sun or

[1] Presented at the annual meeting of the Section of Terrestrial Magnetism and Electricity of the American Geophysical Union, Washington, D. C., April 30, 1925. Published by permission of the Director of the Bureau of Standards of the U. S. Department of Commerce.

[2] Conducted jointly by the Bureau of Standards and the American Section of the International Union of Scientific Radio Telegraphy.

[3] This JOURNAL, **11**: 101. 1921.

[4] M. Baumler, Jahrb. d. Drahtlosen Teleg., **19**: 325. 1922. This matter of simultaneous crashes needs further investigation since a certain number of such coincidences may evidently occur by chance.

[5] Electrician (London), **69**: 75. 1912.

[6] Proc. I. R. E. **5**: 75. 1917.